Workshop on Meteorological and Hydrological Cooperation
within the Asia-Pacific Economic Cooperation (APEC)
12 January 2001
Albuquerque, New Mexico, USA

Meeting summary:

Gen. Kelly noted the purpose of the Workshop was to determine whether there were areas in meteorology and hydrology where the Meteorological and Hydrological Services within APEC could usefully cooperate, to protect the safety of life and property and also to enhance the economic well-being of the respective economies. Gen. Kelly also stressed the interconnection of all the APEC economies and how the services provided by a Meteorological and Hydrological Service in one place affects other places. He also emphasized the need for all Services to share data and information for the improvement of their operations and national economies.

Expert Presentations

Ms. Cathleen Campbell and Mr. William Herrmann, International Policy and Programs, Technology Administration, Department of Commerce presented background information of APEC and its structure and procedures. Ms. Campbell noted the relevant goals for this Workshop of APEC's economic and technical cooperation included developing human capital, promoting environmentally sustainable economic growth, and harnessing technologies for the future. Mr. Herrmann noted the opportunity to interact with the APEC Industry, Science and Technology Working Group (ISTWG) at its Spring or Fall meetings through presentation of the results of this Workshop and, if available, a specific project for their concurrence. He also noted any project undertaken within APEC required only three economies support before approval.

Dr. Chung-Kyu Park, Korean Meteorological Administration, presented the APEC Climate Network (APCN) project, approved by ISTWG in 1999. He noted the goal of APCN was to exchange real-time climate information amongst APEC economies in order to reduce the impact of climate-related natural disasters. He outlined the steps underway to implement APCN, beginning with working with scientists of APEC economies to conduct an experimental multi-model ensemble activity.

Dr. Sri Diharto, Director-General, Indonesian Meteorological and Geophysical Agency, presented the project on Short-term Climate Forecasts and their Application for Social and Economic Development, approved by ISTWG in 1997 for five years. He noted the goal of the project was to relate short-term climate forecasts with food production, and then, to share the information with others for possible wider application. While the project has had a slow start, Mr. Diharto said, with support, plans were in place to complete the project as originally planned.

Dr. William Hooke, American Meteorological Society, discussed reducing natural disasters in the APEC region, noting disasters are inherently international. He challenged APEC economies to find out how much economic loss to Gross Domestic Product (GDP) is caused by natural disasters each year. He mentioned a previous study showing 1% to 2% loss globally from natural disasters. Dr. Hooke gave several suggestions for priority areas for cooperation between

Meteorological and Hydrological Services within APEC in order to build resilience to natural hazards and to accelerate the investment in the meteorological and hydrological infrastructure. During discussion, Mr. Yan Hong, China Meteorological Administration, noted GDP loss in the People=s Republic of China was 3%-6%. Gen. Kelly noted meteorological and hydrological information is not being fully used in decision making, sometimes because of scepticism in its accuracy. He felt there was great potential in informing others of the capabilities which we now possess.

Mr. Curt Barrett, National Weather Service, NOAA, discussed the global water crisis, and how linking meteorological and hydrological information can greatly reduce the impact of this crisis. He said a loss of US$92billion occurred in 1998 due to floods and droughts. Mr. Barrett covered the meteorological and hydrological tools we have, or could have, to detect and predict river and weather hazards. He also mentioned the need to consider both the production of accurate meteorological and hydrological information as well as getting the information out to users in a timely manner.

Mr. Bruce Hicks, Office of Oceanographic and Atmospheric Research, NOAA, described areas where it is important for APEC economies to work together to improve models for transboundary atmospheric pollution, such as accidental radiation release, volcanic ash dispersion, and low-level smoke. He showed how atmospheric pollution affects oceans and inland seas. He also noted the importance of ground truth information to complement model development. He said working together with APEC could help make improvements in this area.

Dr. Ants Leetma, National Weather Service, NOAA and Ms. Candyce Clark, Office of Global Programs, NOAA talked about work underway in the Pacific region to study and understand climate with the goal to improve climate forecasts and their use. Dr. Leetma stressed the economic impact of being able to forecast climate during El Niño, La Niña, and Anormal@ years. He also mentioned the importance of providing support for the Argo program for observing the oceans. Ms Clark noted the need to build a bridge between information and its use, entailing both real-time efforts and research. She also stressed the need to have procedures in place before extreme climate events occur. Ms. Clark noted there was a program already underway within APEC on emerging infectious diseases and how it could usefully be linked with APEC climate projects.

Mr. John Lumsden, Director, New Zealand Meteorological Service, recounted the history of his Service=s strong support for unrestricted exchange for meteorological and hydrological data and products, despite its need to show a yearly profit. He felt open access to public sector data helped national economies overall. He equated meteorological data to air, it has value but no price and it needs to be freely available.

Mr. Timothy Stryker, National Environmental Satellite, Data, and Information Service, NOAA informed the Workshop about the Asia Pacific Satellite Data Exchange and Utilization Group which has met twice thus far. He said the *ad hoc* Group, which is still in the formation stage, involved both national meteorological satellite developers and operators, and was focused on real-time use of satellite data. Among the interested economies were Australia, Canada, China, including Hong Kong, Japan, Republic of Korea, New Zealand, Singapore, and the United

States. In the future, the Group is expected to improve data availability for regional forecast centers, expand telecommunications links (both within and outside the Global Telecommunications System) to serve user=s needs, and foster full and unrestricted use of these data.

Dr. David Fulker, University Corporation for Atmospheric Research (UCAR), described the existing UNIDATA program in the U.S. which supports rapid data flow for meteorological research and education. He said the UNIDATA model relied on Internet distribution of large amounts (about 20Gigabytes per day) of data and products from multiple sources to 160 cooperative Universities. He also mentioned the COMET program at UCAR which develops distance learning modules for meteorological and hydrological training. He noted the modules are available over the Internet for worldwide educational needs. Dr. Fulker went on to describe a concept for an Internet-based Alearning community@ for APEC economies. This concept would improve access to environmental data across all economies and assist with human capacity development.

Country Specific Information

Australia: Felt it was important to advance the science of meteorology and hydrology in the Pacific basin, especially in the area of weather and climate services and natural disaster reduction. Considered that any new mechanisms should be complementary to those that are already effective and not dilute them. Are generally willing to work within the APEC framework, recognizing the need to have support at home at higher levels in the government.

Canada: APEC provides an opportunity to speak to a different community (an economic one) and with an eye to data exchange and involvement of the private sector. Would be supportive of some project development with this framework. But, we should be selective and focused on what we decide to do.

Chile: Important to have feedback to models which are being used in the region. Support free and unrestricted exchange of meteorological data between Meteorological and Hydrological Services, but need regulations for weather business. Also need to recognize the commercial activities of Meteorological Services.

People's Republic of China : Actively supports activities in the framework of APEC and feels that we need to select climate variability and change as well as natural disaster reduction as top priority. The secretariat set up to administer joint projects should follow carefully the terminology and procedures of Asia-Pacific Economic Cooperation

Hong Kong, China: Supports working within the APEC framework, but only on topics not already covered by other regional and international bodies. Perhaps, in the future, an APEC center for weather prediction could be developed.

Indonesia: Supports cooperative projects under APEC, especially sharing resources amongst members to solve mutual problems. Mentioned historical data rescue from tropical countries as an important project to consider including under APEC cooperation. Also, there is a need to

improve operational data quantity and quality. Perhaps, a journal could be prepared to highlight areas of new research and capabilities.

Japan: Especially interested in cooperation in climate analysis and prediction as well as education and training. Activities should not duplicate those activities already done under WMO, but they should complement them. While there can be an APEC group to look at meteorological and hydrological issues, is there a possibility to have some connection with ongoing activities of WMO ?

Republic of Korea: Already involved with APEC through the APEC Climate Network. Feel we need some forum, such as this grouping to carry out regional projects including unrestricted data and information exchange.

Malaysia: Supports cooperation amongst APEC economies in the area of natural disaster reduction. Already working with others in Southeast Asia to study and forecast low-level smoke and haze. Sees advantages in cooperation in the area of technical development and technology use, in building human resources and in increasing public awareness.

Mexico: Have already begun to cooperate with other APEC economies to improve natural disaster reduction, but still need to concentrate on getting the information out to the people affected before, during and after disasters. Locally, there are effects from El Niño and La Niña, although on the average it does not show clearly. It is important to concentrate on local applications of climate forecasting. There should be a practical proposal on how to cooperate with other APEC economies.

New Zealand: Felt there is some possibility for cooperation, but cautioned our deliberations should focus on users= needs more than just those of Meteorological and Hydrological Services needs. Might consider using severe weather forecasting as a topic to try to build an awareness project. Believe by identifying something specific to work together on, it would be easier to begin our cooperation.

Papua New Guinea: Need cooperative assistance to improve its human resources as well as advance meteorological observation and technical systems for efficient and cost effective services. Improving forecasting capability is also important.

Republic of the Philippines: APEC seems to be related, not just to business, but also to meteorological and hydrological activities in the region. Agree it worthwhile to cooperate as far as resources are available. Natural disasters are especially important (up to 1.5% of GNP are affected by tropical cyclones alone). Transboundary air pollution is another important area. The concept of UNIDATA for APEC economies has great potential in the area, as well as making better use of environmental satellite data. Supports real unrestricted exchange of data and products as well as capabilities to make full use of them. APEC should concentrate on how meteorology and hydrology contribute to economic development and sustainable environment.

Russia: Supports the need to concentrate on climate variability and change, especially the APCN

project. Need also to show users how to get benefits from climate information. Also, feels natural disaster reduction is important. New and improved meteorological informational systems should be developed. They must have an integrated approach to meet the requirements of automatic collection and dissemination of observed data and products as well as *ad hoc* information requests. Supports idea of using Internet to get large volumes of data exchanged amongst APEC economies.

Singapore: There is increasing pressure for some Meteorological Services to recover full costs from users. Programs without immediate and direct benefits are becoming more difficult to justify. We have a challenge to continuously enhance our capabilities as users= demands and expectations usually grow whenever services improve. The important areas for cooperation among APEC economies are related to information gathering, processing and delivery: (1) sharing of advanced remote sensing technology, (2) sharing of training resources, (3) emphasis on product interpretation and automization, not just model development, and (4) increased use of Internet and related information technology for exchanging data and information.

Chinese Taipei: Important for Meteorological and Hydrological Services within APEC to emphasize their benefit to national and regional economic development. Development of meteorological services followed stages: (1) improvement of forecasting skills, (2) getting the information out, (3) having proper actions taken in response to forecasts. Perhaps we could concentrate on the application side of meteorological and hydrological forecasts, especially exchange of experiences.

Thailand: Recent flooding has caused 3%-4% reduction in GDP and highlighted the need to increase the lead-time for prediction of natural disasters. Support the idea of a regional prediction center.

United States: Feel we should not limit our thinking but try to take full advantage of the APEC, especially the fact APEC includes high-level individuals. We should think big and make the case of the economic impact of meteorology and hydrology should not be underestimated. Assimilating more satellite data into models is an emerging issue which we all must face. Without duplicating what is already being done by WMO, we can leverage projects, especially in increased Internet usage, to improve our joint activities, such as sharing typhoon forecasts for the Pacific from all APEC economies on one Website.

Vietnam: Can cooperate in the areas of natural disaster reduction. Feel capacity building, especially human capacity building, is one of the most important areas in which we could cooperate. Support concept of working with APEC framework.

Conclusion

The Workshop heard remarks from other participants as well. Dr. Richard Anthes, UCAR, noted that the societal needs for weather and climate services have never been greater and, at the same time, the scientific and technical opportunities for advances are enormous. However, while the paths to the advances in science and technology are relatively straight forward, the social issues restricting effective use of weather and climate products are great and it is not clear how to

resolve them. Dr. Ron McPherson, AMS, noted the need to link the private, public and academic sectors and to continue unrestricted data exchange. He emphasized the need to communicate better with people outside our own community in order to facilitate the expansion of meteorological and hydrological applications in economic sectors which are sensitive to weather and climate. Dr. McPherson felt natural disaster reduction and climate variability should be the top priorities for APEC economies.

It was noted our cooperative efforts should capture the attention of the APEC Business Advisory Council and Mr. Herrmann said working under ISTWG would do so.

Canada, Japan, Republic of Korea, New Zealand, Republic of Philippines, and the USA volunteered to form the small working group following this meeting to develop possible areas for future cooperation and to coordinate with others before going forward to the ISTWG. The USA agreed to convene the group.

Dr. Lam asked the Workshop what projects should be given priority in developing cooperative projects under APEC. The Workshop felt the first priority should be to support the existing projects in climate, being led by Indonesia and the Republic of Korea. As for other priorities, the Workshop noted projects in climate variability, natural disaster preparedness, free and open exchange of data and products, and better ways to communicate with others outside our community.

A discussion was held on the confusion, which can arise when different sources of meteorological and hydrological data was available on the Internet. Dr. Lam noted the WMO Commission for Basic Systems was considering this issue through a task force to look into on how to assure official weather information and forecast were available over the Internet.

As regards data exchange, some expressed the view APEC economies should continue to follow WMO Resolution 40 (Cg-XII), taking into account the full text of the Resolution, including annexes.